SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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CORNISH MINE PHOTOGRAPHS—No. VII.

BY GEORGE HENWOOD.

THE MINERS' HOLIDAY—MIDSUMMER-DAY.

In few parts of England are the remembrances of olden time so cherished and regularly observed as among the people of Devon and Cornwall. In these counties the feasts, fairs, and customs existing from time immemorial are kept up, though shorn, as all such antiquated affairs are, of much of their pristine consequence and celebrity. Amongst them, the most conspicuous is the Flora or fairy dance, at Helston, on May 8: it is still patronised and participated in by the neighbouring and resident gentry. It is said by antiquarians to be the aniversary of a festival of Flora, which goddess is supposed to have had a temple near or in this place; little doubt seems to be entertained on the subject. A ridiculous story or legend is related of a fiery dragon flying over the town on some remote occasion, and the rites attributed to its commemoration. Be that as it may, the Helston people have, and celebrate their feast, which partakes more of the old Bacchanalian characteristics than most ceremonies of the kind. Gaily dressed in their best attire, and decorated with a profusion of flowers, the performers, preceded by bands of music, dance through the principal streets, and through the larger residences in the town, in the early part of the day, which performance is again repeated in the evening. The music is a peculiar light, merry air, known as the Flora dance. No work is allowed to be followed in the town on that day, a heavy punishment awaiting the transgressor. The day is given up to a sort of *abandon* to the dance, music, and innocent revelry, in which all grades of society, ages, and sexes are participators. It is not even deemed degrading to civic dignity to honour the balls by patronage, the chief magistrate often being the gentleman to lead off at the principal hotel.

The fishermen, too, have their holiday; St. Peter's day is their festival, he being their titular saint. This celebration may be easily accounted for, and appears not so much out of keeping. At Newlyn (west), near Penzance, and a few other fishing villages, it is still tolerably well honoured, but is fast falling into disuetude. As soon as darkness approaches, a number of young people run through the streets, swinging huge blazing torches round their heads, and persons, even women and girls, may be seen practising the apparently dangerous pastime; tar barrels blaze from every prominent position, fire-works of every description, but of very inferior quality, are let off in abundance. These orgies are kept up until midnight, when a long string of youth of both sexes pursue their way through the streets, amusing themselves at the game of "Thread the needle."

Such being the customs in vogue among the people generally, it is not surprising that the miners—who, by the way it should be observed, are looked upon by all persons and regard themselves as a peculiar class, seldom mixing or associating with farm labourers and mechanics—should have their holiday. All work and no play is not their motto, or their practice. Their own "day" is Midsummer-day, which is held by them in high estimation. Whence the custom originated is lost in oblivion, but it is conjectured to have been, like the Flora, the remnant of a Pagan ceremonial, as within the memory of many now living it was the day on which wrestling, a game in the West of England confined to Devon and Cornwall, was universally practised in these districts; this game has been played from time immemorial by miners and tinners; though still much encouraged, it is far from being so much in vogue as it was even some 20 or 30 years ago. The late Dr. Paris ascribes these games on Midsummer-day to a commemoration of a feast of Hercules, or some other heathen divinity, introduced by the Romans or Phœnicians, both of whom are known to have traded to these parts for tin; what seems in the doctor's opinion to strengthen the idea is, that the paintings and statues of combatants of the athelетæ at the Olympic games, still extant, correspond materially in their attitudes and actions with the wrestlers of these counties at this day. At present, wrestlings are frequently held on the miners' holiday, but not to any very great extent.

On most mines, the men on this day whitewash and clear out their changing-houses, the outside of the mine buildings, &c. Where the adventurers will afford it, great pride is taken in having the building and woodwork re-painted, the dressing-floors swept up, and everything put into perfect order. If the mine be productive, large branches of green oak, called the "Midsummer branch," are placed on the shears of the mine, and a new and gaudy flag is attached to the vane, containing the initial letters of the name of the mine, and fixed on the highest part—the shears, if there be one, being usually the place selected. Little or no work is done underground on this day, it being literally and veritably a holiday. The men are always allowed one shilling, and the women, boys, and girls sixpence each, as spending money. By mine proprietors this is seldom objected to; indeed, it is one of those old customs it would not be well to attempt to abrogate. Surely, one shilling per man per annum cannot do much injury to a mining company. The greatest mischief is done by the men going to the public-house, where not only is the shilling spent, but many a hardly-earned one is added; there is, however, much less drunkenness prevalent than was wont. The change of manners, effected by various causes, is nowhere more visible than in our miners, who were formerly notorious for their spendthrift, dissolute habits, rough demeanour, and uncouth language; still, there is the old leaven left, which occasionally appears, to use their own apothegm, "when the liquor is in the wit is out." On the whole, however, their progress in society is most encouraging; they are now noticed as a particularly intelligent, shrewd, civil, and thrifty set of men. The Cornish *patois* is fast disappearing; many words which ten or twelve years since were in use are now obsolete, except in the most remote places.

But we digress, therefore let us return to the miners' holiday. The Midsummer-day is now generally spent in parties of pleasure, and excursions to the neighbouring towns and villages on the sea coast. The opening of the railway to Penzance and Truro has afforded facilities to the vast mining population of the Camborne and Redruth districts, of which they have not been slow to avail themselves—thousands enjoying a cheap trip to the former watering place to get a "pennoth of sea," and to the latter to view the "lions of Truro." As soon as the railway shall have been opened to Plymouth, further excellent opportunities will be afforded to gratify that innate desire all feel to gain information by experience and going from home; even though it be in so limited a degree, it is an evident improvement on the old system. Now, the question presents itself, Would it not be well for the proprietors of large mines, or by union among small ones, to organise and patronise such trips? No doubt the men as well as the children would willingly spend their Midsummer money in such amusements, in preference to loitering about home in their own neighbourhood: there would be more really useful lessons and morality taught by such agencies than by the most laboured eloquence or devout exhortation. There might also be a great improvement made in the amusements provided at Penzance, and other watering places along the coasts of Devon and Cornwall on this day, which is also a general holiday—the exhibition of Manby's and other apparatus for saving life in cases of shipwreck, and the use of the life-boat exemplified, by which means our working population in these localities would become familiarised with the uses of these invaluable discoveries. A small premium would secure attention and create emulation. The officers of the Coast Guard could and gladly would experiment and instruct. By these means much good might be accomplished, much useful knowledge conveyed, and that, too, through the medium of pleasure, which is far more easily effected and better relished than by any other method. This practice may be useful to all classes, as even the wealthier would be attracted to the scene; and who knows that even they may not require such knowledge?

Had these displays been as familiar as they should have been on a coast like that to which we refer, or even throughout the whole island coasts (for we are essentially a maritime people), many a harrowing detail of shipwreck would have been spared. How frequently do we read of apparatus having been on the shore in the time of distress, when no one knew how to use them. And how often has the rope, even when thrown on board the vessel, been misapplied, by being fastened to one man, and drawing him through the surf, instead of hauling a rope on board the stranded vessel, and by his ignorance losing probably his own life, and depriving his fellow-shipmates of the messenger of hope and of deliverance? From their familiarity with danger, their daring habits, their knowledge of the uses and powers of gunpowder, few men are so well adapted to the pursuits as our miners, from the circumstance of many of the mines being situated in places where these casualties occur; and from the numerous opportunities they have of boating in the various creeks and harbours, in some parishes—for instance, St. Just or St. Agnes—many of these men are half sailors, and from their habit of continually emigrating to all parts of the world, they are pre-eminently the class of men to whom such knowledge should be imparted, not only for their own personal benefit, but for the good of mankind. It is said every man should be taught to swim; true, it should be so. This practice we agree is quite as necessary, and would be of great benefit. The men and the places are available; it only wants an example to be set by some benevolent and influential individuals as an experiment, which we are sure would be successful and highly attractive, would be a great benefit, and would convert the miners' holiday, Midsummer-day, from a scene of uselessly expended vigour, energy, and strength, of vice and drunkenness, into a day of cheerful recreation and instruction, to knowledge of really great benefit to themselves, and to a great improvement morally, intellectually, and physically of our industrious population. We offer these practical suggestions to those whose duty it is to see to the proper application of the "Miners' Holiday, Midsummer-day."

RATING OF ROYALTIES OF MINES.

The committee reassembled on Tuesday. Present, Mr. Kendall (Chairman), Mr. Dudley Fortescue, Mr. Ridley, Mr. Davey, Mr. Foster, Mr. Colville, Mr. Hussey Vivian, Mr. G. Cavendish, and Mr. Michael Williams.

Mr. Warington Smyth, of the Restormel Mine, Cornwall, re-called, examined by the Chairman,—He said he was anxious to add to his former evidence a supplemental statement. It had been said he had made some statements that were incorrect with respect to the accidents that had occurred. From an examination of the books of the mine, he could state that the average poor-rate for four years was 2s. in the 1*l.* per annum, and that the property was rated upon two-thirds its annual value.

The Chairman said, from his own knowledge, he thought the latter statement was hardly correct.—He was aware it was not quite correct, because, as Chairman of the Board of Guardians, the rating went through his hands.

Examination of Mr. Smyth continued,—Mr. Smyth was understood to say, out of 124 persons employed in the mine, 53 resided in the parish where the mine is situate. After an examination of the books, he could state he did not know that any person belonging to the mine had become chargeable to the parish during the last six years through accident. Since the 1st of June, 1852, there was an average of 88 cases, who had received 189*l.* odd annually from the relief fund. All the accidents were very trifling. During the last six years there was only one accident of a serious nature, caused by a premature explosion during some blasting operations, in May, 1854, by which two men lost their sight. The men had been provided with 7s. per week, and one of them at the present time, with the assistance of his wife, was keeping a shop. A little more than ten years ago a family received 1s. 6d. per week from the parish, but since that family none have been chargeable to the parish. The fund of the club has enabled all parties who met with accidents to keep off the parish. As to the sudden suspension of the mine, in 1847, a great number of men were thrown on the Union, but from the accounts he had the lord's dues were higher in that year by far than for several years following. The people in the neighbourhood are by no means actuated by feelings of hostility to the miner or to us. We have been tenants of the mine some years. He said originally the mine was a benefit rather than otherwise to the neighbourhood and the farmers, and he saw no reason to change that opinion. He believed occasionally the farmer had a difficulty in finding labour. He knew that the ironstone miner took setts of the land which he was gradually bringing into cultivation, and in one instance he knew as much as 2000 acres of waste had been thus brought into cultivation. Up to 1843 there were no leases in Cornwall; the tenure was different, but then they changed to leases, which contained a money payment. He had mineral property on Dartmoor, of which as yet no lease had been granted. He also held under the Crown on Exmoor, where mining is quite in its infancy. The conditions under which he held the land there was the payment of a small fine and low royalty, with a reservation of the minerals; it was very analogous to the state they were in in Cornwall many years ago. The population on Exmoor was extremely thin, and it was very much desired to encourage mining, for the purpose partly of bringing a population to cultivate the land. All parties there are extremely anxious for the success of the mines, having regard to an increase of population. On Exmoor a certain portion of the minerals are reserved by the Crown. As far as mining operations have gone there, he had reason to believe there were very valuable lodes, partly of hematite. He was quite sure it was the opinion on all sides to have mines there for the purpose of raising the value of the land. He would like to impress upon the committee the great difference, if mines are to be rated, there ought to be in rating mines; according to the manner in which the ore was found and the mode in which it was raised. He would classify all mines, and rate them according to their natural circumstances. He referred principally to those iron mines found in North Staffordshire. I suppose as it is more profitable you would tax it higher?—If it is thought desirable to tax it at all. There are some few deposits which are exceptional, and which can scarcely be reduced to anything like position. He thought it was an anomaly that coal should be taxed and iron not. There is a sort of running fight as to the rates between the colliery owners and the guardians of the poor. It would be desirable to put the matter upon some intelligible basis. When an accident occurred, so that the mine stopped, every one of the miners were drafted off to other mines within five weeks of the time of the accident. His informant as to the Restormel Mine was the accountant of the mine. After describing the mode of working out the ore, he said he believed enough was given to the families of the miners to support them in case of need, and prevent them from going to the parish for relief.

Mr. Joseph Pease, late M.P. for Durham, examined by Mr. Ridley,—I reside in Darlington, and am very largely interested in mining transactions of various kinds—ironstone, limestone, and also in collieries. I work the mines as lessee to a very great extent. I have some freehold mines, but they are very limited in extent. The coal mines in which I am interested are some of the largest in the county as regards the aggregate produce, but the mines themselves are not upon so large a scale. The leases of my coal mines vary from 20 to 40 and 50 years.—Upon what principle does the rating of the coal mines proceed?—We find, I apprehend, that there is no principle at all; it is always a matter of compromise with the overseers, by whose surveyor we are assessed. In some cases we are rated upon the fixed rent; in others upon the addition to the fixed rent. In others they estimate the profits of the mine, and assess upon that, and in some cases upon the cottages and coke ovens. It is clearly a matter of compromise, without any principle whatever. They generally assess the rate, taking the whole mine in group. Our notion is that they estimate what the mine can afford, and they charge the full amount of what they think it possible to exact, they scarcely knowing themselves upon what data they are proceeding. I think I opened nearly all the mines I am now working. The expense of opening a mine varies very materially, but it is always a very expensive operation. There is always a very considerable risk in opening a coal mine as well as any other mine. The deposits are often very capricious. The deduction they make upon the sum they rate upon is, I find, different in every parish. The anomaly extends to that—in fact, the real prevailing idea is, what is the prosperity of the mine? I am also the owner of the surface lands, and farm very extensively. I think the value of agricultural land is very largely increased by coal mines. I have not, however, met with many farmers who agree with me upon the manifest advantage and extreme value of having a market for their produce at home, instead of competing with distant markets on their own ground. I have bought provender very largely—about 480 tons of hay and 3,000,000 lbs. of wheat at London prices, by which I ascertain that the farmers there are remarkably well off for a market. Labour in my part of the country is very scarce, and the farmers find it difficult to get good labourers. The mining trade is gradually extending, and has been doing so for the last 10 years or more. During that time the alteration in the rating has been very small indeed. Confining myself to the coal mines, the rating of them has been on the average 1s. 5d. in 1*l.*; some of them are as low as 5d. in 1*l.*, and others as high as 2s. 5d. in 1*l.*, but the latter only takes place when the town population comes in with the mining population—take, for instance, Bishop Auckland. The highway-rates are in the same way. In small townships they are as low as 4d. in 1*l.*, while in the larger one (Bishop Auckland) it is as high as 1s. 2d. For one year the latter was as high as 2s. 6d. in 1*l.*, but that was a very extreme case. We also pay church-rates, and what is called improvement rate, when we come within the range of the Health of Towns Act. All these rates are assessed upon a very anomalous state of the law. As to our mining population, in the event of sickness or accident there are clubs. We have only one, and we offered to subscribe one-fourth to their three-fourths, but I do not think that has worked well. As regards accidents, there is a general gathering among the miners, and as long as ever the miner or lad is unable to work he receives 5s. a week from us, which is called "smart money." We also pay the medical man for the medical attendance until convalescence. A great many of the men are what we call "Foresters." I have between 1000 and 1200 houses of my own, where the miners live rent free. I also find them their coals, upon their paying 6d. a fortnight for the delivery of them at their doors. There is also a public oven which they can use. Schools are also provided for the children. If a coal mine is worked out the population soon becomes absorbed, for a languishing mine is always forsaken. Whenever a mine is getting poor the best men gradually leave it, and the reduction of the men is so gradual that it is not perceived. When a man leaves the whole family go away together.—What is your opinion generally on the subject of rating coal mines at all?—I have a very strong opinion that the rating of mines is very wrong in principle. I look upon it generally in the light of affecting the trade and commerce of the country. I think it has a very general relation to the ordinary commerce of the country, as any increase of imports is, I find, made up by an increase of mineral exports; I, therefore, think a rate upon minerals is as offensive to good policy as any that was ever imposed. As, however, coal mines are rated, I do not see any reason why other mines should not be rated. Speaking, however, in a relative sense, there is no greater relief that could be granted than to put this question of rating upon some definite principle.—Are you able to state to us upon what principle you would place these coal and other mines?—Now, if different parts of the mine are in different parishes, each of them are endeavouring to get as much out of the mine as they possibly can. The real simple principle of rating, however, is to rate upon the rent. I would take the principle suggested by Mr. Schneider, and capitalise the value of the mine. I have applied that to my rating, and find it would be rather in my favour this year—about 10 per cent. Supposing I pay this year 3000*l.*, which for 10 years would be 30,000*l.*, that at 3 per cent. would be a rate upon 9000*l.*, and that taking the adjuncts would come to about what we at present pay on the average. My own opinion is it would be a saving to me of 9 or 10 per cent., but when trade is bad it would be no saving at all. The advantage of such a system would be that the matter of rating would be made quite easy. In rating upon that principle, I should be content with a reduction of 3 per cent. At this moment I pay 20,000*l.* per year rent; that for 10 years would give 200,000*l.* A rate upon that would be about as much as I am now rated upon.

In answer to Colonel Pennant,—I think this is a fair principle, but I do not approve of rating the *corpus* of an estate, nor of rating minerals.

Examination by Mr. Ridley continued.—In laying down a principle of rating, I think that mines ought to be classified under certain heads—coal and iron mines under one head, and lead and tin mines under another. I could not draw any such distinction, but that may arise from my ignorance of the peculiar circumstances affecting different metalliferous lodes. It appears to me the *bona fide* rent paid is the only true data upon which to go. You do not then come back to the present state of uncertainty, nor would you have to appeal against the rate as you have now; for when it is known the rent you pay to your lord, the whole thing is settled. It is true we should give the overseer access to our returns if the royalty were taken as a basis. I have worked a large ironstone mine for the last five or six years. First of all it was an open quarry, and we paid rates; now it is a close working, a mine, and I am not rated. I should think the men and boys employed in my district are upwards of 3000, and I think I have between 800 and 900. It is a district that is not likely to be worked out, as from the investigations that have taken place on the same levels, it seems likely to exist in large quantities. I am the lessee under the Crown, Lord Zetland, and other noblemen and gentlemen, of some portion of the surface land, which has very considerably increased in value since the mining operations commenced. When I went there I had to pay 4*l.* rent premium for grass land for my horses for the tenants to go out, and I offered 7500*l.* the other day to a neighbour for some property for which he gave 5000*l.* some time since. Our agricultural labourers are of the most respectable class. In consequence of the high wages paid to miners, the poor-rate has not increased. In the principal townships the rate in 1847 was 10d. in 1*l.*; 1848, 1s. 2d. in 1*l.*; 1849, 1s. in 1*l.*; and in 1850, when the ironstone mines began to be worked on an extensive scale, 9d. in 1*l.*; in 1853, 10d. in 1*l.*; in 1854, 1s. in 1*l.*; in 1855, 10d. in 1*l.*; in 1856, 1s. in 1*l.*; and this year 10d. in 1*l.* again. Then in the next township, for the last five years, the rates have been 11d., 8d., 7d., 5d., 6d., and this year 5d. in 1*l.*, and there I have 500 men employed. There is now a very considerable importation of all kinds of food. When I first went there it was an exporting country, but now we are obliged to import heavily. In the iron mines of which I am lessee we do not find cottages for the men; but I believe that has arisen from local difficulties—the short tenure of the leases, which makes us hesitate before building houses. The general rule, however, is to offer 7 or 8 per cent. to parties who will speculate in building in more remote places. As regards the minerals, there is a very great increase of importation; but as regards coal particularly, there is a decrease in the amount shipped, the consumption being so extensive for the manufacture of the iron; and a very large proportion formerly shipped as coal is now shipped as coke. The ironstone district of which you are speaking was rated as long as it was a quarry working. Do you think there is any valid reason why ironstone mining should not be subject to the rating of the poor as well as a quarry?—As I go underground I cease to interfere with the rateable surface of the land, whereas quarry works destroy the rateable property by removing the surface. You would say, as regards ironstone, that it should be rated to the poor with coal, if a proper principle were laid down?—I do not see how I can draw the distinction, as I can only rate an advantageous adventure. I see no distinction to be drawn between one set of minerals and another. But, speaking as an Englishman, I think it better not to rate mines at all. You look upon it more as a terminable annuity, and would rate it in that way?—Yes. I should like to ask you a question or two before I conclude about the character of the mining population:—What is the general character of the mining population, both in the coal and iron trades? Are they quiet people?—The ironstone men are very industrious and extremely well-behaved. One of our magistrates, in speaking to me some time since, expressed his fear we should have a very different class of people, but we have found a very great improvement in them and their families. I think the colliers as a class have very greatly improved in temperance as well as everything else, and, generally speaking, I think we have no ground to complain. They are not open to the reproach that has been made against them?—They may not be compared, perhaps, with the mining population of other parts of the country. The boys do not work below the age of ten. They then are "screeners," and pick out the foreign matter. Next they go down into the pit, and become "ventilating boys;" then drivers, first of ponies, then of horses; then they assist in getting the coal, and finally become "coal hewers." The amount of money brought in by sons in a coal district is something very large.

In answer to the Chairman,—All the mines with which I am connected have been opened within the last few years, and we have not had any increase of poor-rate since the mines have been opened. We have increased the rateable property and reduced the rate. I think we have increased the value of farming property 6 per cent., and household property 80 per cent. In 1851 the rate was 11d. in 1*l.*, on 962*l.*; now it is 6d. in 1*l.* on 1532*l.*—the rateable value of the property in my parish. We have increased the wages of the agricultural labourers, who are most respectable. Our ploughmen get 15s. a week, with so many bushels of potatoes, milk, &c. I always find it worth while to give an extra allowance of this kind, for you get an improved man. I think the increased price of the labour is made up to the farmer by the market we afford him. As to the highway-rates that has been 7d., 8d., 9d., 9d., 7d., and 6d. in 1*l.* In the adjoining parish it is as high as 1s. in 1*l.* That falls upon the agriculturists, but we are rated to the highways upon our furnaces and coke ovens. For instance, a furnace costs 5000*l.*, the adjuncts 1000*l.*, total 6000*l.*; that at 4 per cent. is 240*l.*, less one-fifth, 200*l.*, and upon that sum we are rated. I apprehend the police-rates will be increased under the recent Act, as the police may be appointed in a ratio of the population. There is no principle in the exemption of iron mines, but I think it is very important for this country that all its minerals should be exempt. It is a very interesting fact to me that the excess of imports is always balanced by the increased

exports of minerals, which is a most happy circumstance. Therefore, I am afraid that taxing the mineral wealth of the country is a tax upon labour. You have not very much hope that all mines shall be exempt?—That is a matter of indifference to me personally, but, as an Englishman, I think it desirable not to do anything which has a tendency to bring about a scarcity of labour. When I make an application for a lease of mineral property, I calculate all the items, including a margin, and if the margin be affected by the poor-rate, in so far mining enterprise would be injured. If the poor-rate, too, were 5s. in 1l., or 25 per cent. on the dues, it would have in times of scarcity a very serious effect. I do not know of any coal mines being closed in consequence of being rated to the poor. We have had a very productive trade, both in coal and iron, for the last four or five years, but that may or may not continue. It is quite clear, however, if the rates were doubled it would require a very good trade indeed to meet them.

In answer to Col. PENNANT,—I think the rating of mines would operate generally in checking that liberality which is now extended to miners. I come to that conclusion from what I have seen in the papers, and that would, I think, be more so in Staffordshire, where there are people employed called "butties," or middle men (who frequently keep public-houses), so that the respectable owner of the mines never comes in contact with his men. Supposing the principle of Union rating was adopted, that would give rise to dissatisfaction.—We are first rated upon the coal, and then upon the oven in which the same coal is converted into coke; we are thus rated, first upon the raw material, then upon the manufacture.

In answer to the CHAIRMAN,—I think it is contrary to national policy to rate mines at all. At present there is no principle of rating. It is literally a matter of compromise, and a constant source of litigation. My plan, generally speaking, would be to make the royalties the basis of the rate, and capitalise that at about ten years' purchase, or thereabouts. If a principle were laid down it would put an end to all heart-burnings. I conceive there would then be no difficulty about the matter. I never heard the question mooted by agriculturists.

In answer to Mr. RIDLEY,—Continual disputes arise about the rating of coal mines. In such cases arbitrators are called in. In the first place, the matter is brought before the Petty Sessions; thence it passes to the Quarter Sessions; and after two or three days have been expended, and everybody wants to get home, the magistrate looks round the court, and asks Mr. So and So to become the arbitrator, and there is an expense of 500*l.* to 600*l.* to pay.—Well, then, they must go upon some principle?—I apprehend that every man who undertakes the duty of arbitrator goes upon a different principle.

In answer to Mr. FOSTER,—I think the rating of mines in my district is a sort of compromise. If they think the mine can afford to pay a full rate they assess it, and if I offend them in 1856 by appealing, they rate me higher in 1857. I believe, when the overseers are what is called endeavouring "to string up a mine," they take into account as far as they can whether it is profitable or unprofitable.

In answer to Colonel PENNANT,—I would apply the principle of rating upon dues, where a lord works his own mine, by comparison with other mines of the same extent.

In answer to the Chairman,—I have never ascertained the principle upon which any compromise has been come to. I have seen sheets upon sheets of foolscap, containing all sorts of items, but last [of all the result came out I could not tell how. When I spoke of capitalising at ten years' purchase, I alluded especially to coal mines. For tin and copper mines the average would be, I think, seven years, and I would capitalise that. I would deal with each class of mine according to its actual value.

Mr. TAYLOR examined by Mr. RIDLEY,—I reside near North Shields, and am very largely interested in coal mines; I am also a mining engineer. There is a principle of rating recognised and acknowledged, upon which the coal mines of Northumberland are assessed; it is called the tentall rent. There are two rents, one is the fixed and certain rent reserved in the lease, and the other is the royalty paid after raising the quantity of ore reserved in the lease, and that additional rent is called the tentall rent. After explaining the principle of rating where different parts of the mine were in different parishes, he proceeded to state that the tentall rent, being taken as the basis of the rate for the colliery as a whole, was then divided by the colliery owner according to the value of the different items making up the colliery; plant so much, tramway so much, houses so much, and so on. He then said, I think that principle is applicable to iron as well as coal mines. Supposing mines are rated as a whole the details ought not to be rated separately.—Is it your opinion that coal mines should be rated at all?—As a question of national policy, I should doubt whether they ought to be rated.—As they are rated, do you agree, also, with Mr. Pease that other mineral mines should follow?—I do not see any distinction. It is the usual custom in our leases that we should pay all rates. In case of accident to our pitmen we pay "smart money." The head officers have 10s., the ordinary workmen 5s., and boys 2s. 6d. per week. We also give them medical attendance—the surgeon, in fact, being one of the regular officers of the mine. They pay no rent for their cottages or gardens, and they are allowed coals free on paying 6d. a fortnight for leaving the coals at their doors. There has been a great improvement in the schools during the last twenty years, and now there are no collieries without schools. They are very much improved in their habits and morals. The salaries of the schoolmasters and mistresses are guaranteed, and in some cases, I believe, advantage is taken of the parliamentary grant for education. The value of agricultural produce is very largely increased. The plant of a mine is not rated before we get any produce. In general, the opening a new coal mine is a very hazardous and expensive operation, and the cases of failure are very numerous. In the case of the Seaton Delaval Mine, the sum of 200,000*l.* was embarked, and coal was not found then. At all times the opening of a new mine is attended with considerable risk from "drowning out" and "fire damp." Supposing such an accident occurs to a mine, the entire population is speedily drafted off to other mines. There is a scarcity of mine labour, and there is no difficulty in miners getting good employment. I do not know of any cases where families have become a positive burden to the parish for any length of time. To enter into the question of profit would open up the whole question of mining operations; but from calculations I have myself made, the profit realised is 4 or 5 per cent. on the capital embarked. The general royalty paid is about 6d. per ton. We pay 5s. and 6s. a day as wages, and give constant employment to our men. As a sort of general rule our men make 1s. per hour; I am speaking, of course, of the coal hewers. The miners live to a good age generally, without chest diseases, and, upon the whole, are a healthy population. They do not save much money as a general rule, but are well conducted people upon the whole. On pay nights they may take an extra glass of beer or whiskey, but that is all. They do not add to the expense of the police-rates. The coal owners contribute very largely to the local infirmaries and sick societies, and have the right of sending their men there to the relief of the poor-rate. The men do not generally go to them, but are attended more comfortably in their own houses by the colliery surgeon. In colliery districts there has been no increase of rates, but a partial decrease, partly owing to the circumstance that the rateable value of property has increased.

In answer to the CHAIRMAN,—The lessors are the Duke of Northumberland, Lord Ravensworth, and others, who are large landed proprietors as well as proprietors of the mineral. We not only pay poor-rates, but take care of our miners. The "smart money" only applies to cases of accident. We get an allowance from the lord for the "shorts" we are liable to before we get into the beneficial working of a new mine. From our tentall rent there is a deduction made of one-sixth for the purposes of rating. I conceive the rent is the final result after making allowance for all contingencies.

In answer to Mr. FOSTER,—The lessee makes his calculation, amount of capital required, redemption fund, interest of capital, and so on; all those items have to be taken into account before he can afford to pay the landlord anything; the rent, therefore, is the final result. The *corpus* question is thus provided for. I see no reason why ironstone mines should be exempt, there is nothing peculiar in them. They have been very profitable the last few years.

In answer to Mr. RIDLEY,—I think mines fall into a natural classification.

Mr. FOSTER, of Seaton, Durham, examined by the CHAIRMAN,—I am a general and mining engineer, and have the sole care of a mine in Northumberland, the lessor of which is the Marquis of Hastings. It is entirely a coal property, and was opened up about 1841. I heard the whole of Mr. Taylor's evidence, and agree with all that he has said. The families of miners fall back upon the poor-rate in case of illness only. The rateable value of my parish is about 12,000*l.*, and we pay upon the mine about one-third of the rates. I confirm generally what Mr. Taylor has said.

Mr. WM. DICKINSON, of Cumberland, examined by the CHAIRMAN,—My attention has been called to this matter as a surveyor of mines for the purposes of the poor-rate. I know of the condition of the iron mines in the Whitehaven Union, which comprises 12 or 14 parishes. The iron mines are profitable working, and have considerably increased the population: they do not pay the poor-rate. The highway rates are very much increased, owing to the traffic in carrying the ore: it has been increased gradually from 3d. to 1s. in the pound, and this year will, I think, be 1s. 6d. in the pound. I believe such increase is entirely owing to the iron mines, which in no way contribute. These mines in no way contribute to the prosperity of the farmers: they are prosperous, but that arises from the general prosperity of the times. The iron miners are a troublesome population. It is a matter of complaint amongst the agriculturists, and I see no reason why these mines should not be rated. The small farmers are likely to be benefited by carting the ore, but I do not think it is a profitable traffic, as the farm is neglected. The basis of rating the plant is per horse-power.

In answer to Mr. HUSSEY VIVIAN,—The effect of the stoppage of the iron mines would be to throw a great many people upon the parish. The rateable value of property in the parish has been increased, and we have the advantage of that as far as the poor-rate, but not the highway rate, is concerned. Railways are generally constructed for the carriage of the iron ore, and there has been a proposal to extend it to the mines to which I have referred. The burden upon the highways may, therefore, be only temporary. It has never come within my knowledge in my district that mines have stopped, but, on the contrary, they have progressed.

In answer to Mr. FOSTER,—The inconvenience arising from carting the minerals would not be affected by rating the minerals, as the roads are cut up in parishes where the mineral is not raised, and the rating in that parish would not aid the rate payers in another parish. It is an incident; therefore, the mere carting of the ore has nothing peculiar about it.

In answer to Mr. M. WILLIAMS,—The working of these mines bring a poor population, and increase it. I do not think it fair that that population should be left there after the mine stops, the mine owner having contributed nothing to the relief of the poor. I do not think such contribution should be based upon the royalty, which is a payment to the lord for the exhaustion of the property.

CLOSE OF THE ENQUIRY.

The Committee reassembled on Thursday. Present—Mr. Kendall, Mr. Dudley Fortescue, Mr. Davey, Mr. Colvile, Mr. Hussey Vivian, Mr. Michael Williams, Mr. Smith Child, Mr. Phillips, Mr. G. H. Cavendish, Col. Pennant, Mr. Foster, and Mr. Ridley.

Mr. JOHN SIMPSON, examined by the CHAIRMAN,—I reside in the northern division of the county of Lancaster, and am relieving officer of the Union at Dalton. We have a great quantity of iron ore mines, which during the last five years have been very much increased. They are open and close workings, and none are rated. The poor in general have increased, but not so much as the rates, which have increased in consequence of the accidents in the iron mines. During the last 20 years we have had 10 men killed, leaving 10 widows chargeable to the parish. In general in cases of accident the owners of the mine provide for the family of the miner. The highway-rates have very much increased. The various lords of the manor, on which the iron mines are, receive more than the other proprietors in the neighbourhood, and they pay no rates whatever. There is great complaint by the farmers that the ironstone mines are not rated. As far as the ironstone masters go, I have no doubt they realise great profits. I do not think the farms have increased in value; eggs and butter may have increased, but so have the wages of the farm labourer. I think the shopkeepers are the people that are mostly benefited. I think the ironstone mines ought to be rated to the poor and highway-rate. I consider that the mines now in their time of prosperity should pay something, because if the mines become dull they may shut them up; the mining masters may then go away, but the land cannot, and we shall have to support the poor mining population. They ought to pay a little now in their prosperous days. We have a good many cases where the owner of the surface and the mineral is the same person, and in such cases, whether the mine is rated or not, the owner will not be injured.

In answer to Mr. COLVILE,—You say that the farmers complain; it is not a very unusual thing for the farmers to complain, is it?—I do not know, I am sure. I suppose these mines were open when the farmers took possession of his land?—Some of the mines were. They took their farms with the knowledge that they would have to maintain the miner?—They did not think there would be so many. The increase in the number of our mining population has been very great. In 1851 it was 6540, and now I have not the least doubt the number is 10,000.

In answer to Mr. HUSSEY VIVIAN,—The horses eat hay and corn, which the ironstone masters cultivate on their own farms. A great many of the cattle are sent to the Manchester market, but we do not import cattle into our district; a great part of what is consumed comes from the farmyards in the neighbourhood.—Do you think if there were no rates the farmers would be able to pay a higher rent?—Yes.—To the extent of the rates?—They would.—Indirectly, then, the rate comes out of the landowners' pocket?—Yes. I do not think the district generally would be benefited by the stopping of the mines, because the miners are there. I cannot say whether, if all the miners were away, the district would suffer.

In answer to the CHAIRMAN,—We do not depend upon the miners for a market. The rents have not increased in consequence of ours being a mining district. I do not think the farmers have been induced to give a higher rent for their farms in consequence of there being a large mining population. If the highway-rates are increased, the farmer does not get any reduction from his landlord. I do not think there is any plant of the mines that is rated to the poor.

Mr. GEO. FISHER, malster and small farmer, examined by the CHAIRMAN,—I live in Dalton, Lancashire, and have done so all my life. The Furness Railway was made about 11 years ago, and about 200 houses have been built from that time to this. The whole of the tramways in the parish are rated at 108*l.*, and they belong to the ironstone masters. The railway and the houses are also rated. With these exceptions the rating has remained as it was. The rate is now 1s. in 1*l.*, and has been so for a long time; it has not increased in extent. The rateable value of the parish was 17,000*l.*, but now, with the additions of the railway and the houses, it has run up to 22,000*l.* There is one road in the parish upon which we expended 10*l.* a week in widening it, and such expenditure was rendered necessary by the carting of the iron ore, although at the same time the ironstone owners paid nothing towards the highway-rates. A rate of 6d. in 1*l.* for the roads would be sufficient if the mines were not there; it is now 2s. in 1*l.* I am in favour of rating ironstone mines to the poor and highway-rates.

In answer to Mr. COLVILLE,—I came here to represent the agricultural interest, but I did not come here to say anything but the truth. The miners have increased very much during the last ten years, but the poor-rates have not increased. We have brought to us in the miners additional customers for butter and eggs. I am not satisfied with the present state of things—I am not satisfied with their trespass upon my land.—But, with the exception of this trespass question, you don't wish to see any alteration?—I wish to see them rated to the roads.

In answer to Mr. HUSSEY VIVIAN,—The road has been widened in consequence of these mines. It was so full of their carts that gentlemen could not get by. It leads to other villages. The ironstone master buys his hay and corn anywhere where he can get it in the district, which, no doubt, is a great convenience to the farmers. A great deal of our corn goes to the markets at Preston and Wigan; and I, as a malster, do not sell 50 quarters of malt during a year in our neighbourhood. When we sell in the neighbourhood we get the ordinary market prices for our produce.

In answer to the CHAIRMAN,—The prices of hay and corn have not increased since the mines have been in our neighbourhood. The widening of our road, upon which we spent 10*l.* a week for six months, was entirely owing to the mining operations.

In answer to Mr. HUSSEY VIVIAN,—The cost of delivery at a distant market is 1s. 6d. per quarter, and the average produce is six quarters of corn per acre.—If these six quarters are delivered on the spot there is an advantage of 9s. per acre?—That would be so.

Mr. JAMES COTTERELL, land agent, of Bath, examined by the CHAIRMAN,—I think we have in our office the whole of the stone quarries in the neighbourhood of Bath. We survey the whole of them, settle the rent, and receive the money. The chief owner is Mr. Vivian, and other gentlemen. The general terms are to pay so much for 16½ feet for open quarries, and where the stone is worked underground so much per superficial yard. As to the poor-rate, we always provide that the tenant shall pay all parochial rates. The surface quarries are rated, but the underground quarries are not. The surface quarries are not rated upon any particular principle. As a general average, the minimum rent is a third of the royalty paid to the lord; and, in some instances, the minimum rent is rated, and in others the royalty is rated. There has been no dispute as to the rating of open quarries, but great dissatisfaction has been expressed in the neighbourhood of Box and Corsham. We have had two or three instances where a quarry worked openly was rated at first, and when it began to be worked underground it ceased to be rated. The law rests upon a very narrow ledge—the decision of the Wiltshire Quarter Sessions—and is to my mind a very great anomaly. I do not see why open quarries should be rated, and close quarries not. In the case of Monkton Coombe Quarry, the royalties are something like 2000*l.* a-year, the whole rateable value of the parish, exclusive of the quarry, being about 3000*l.* a year. In the parish of Box, the rateable value, exclusive of the railway, is about 5000*l.* a year; the railway is about 2000*l.* a year. The royalties of the open workings are 300*l.* a year, and of the close workings about 1200*l.* a year. The close working is not rated at all, and that has caused very great dissatisfaction in the parish. As to the highway rates, I do not think they are increased, as the whole of the close quarries are assessed to the highway and church rates. The only rate they are exempt from is the poor-rate. They submitted to the highway and church rates. The quarrymen get about 18s. a week, upon the average, and are well conducted. There is not much difference in the men; they shift from an open quarry to a close mine indiscriminately. I do not think the poor-rate has increased. I have no doubt that many of our close workings are made to avoid payment of poor-rates. It is more dangerous working it as a close quarry, but they submit to that danger rather than pay the poor-rate.

In answer to Col. PENNANT,—I think the risk of working it as a close quarry is more than equal to the payment of the poor-rate.

In answer to the CHAIRMAN,—As to the rating of coal mines, that is a very vexed question as to the amount to be assessed. It seems, however, to have settled down to an assessment on the royalty, subject to a deduction of 10 or 15 per cent. In the case of coal mines, I attend as a surveyor on the part of the parish. My object is to put them as high as they can bear. The royalty, generally speaking, varies from 1-12th to 1-16th, according to circumstances. In the Gloucestershire district it is as high as ¼th. That is the value of the coal when landed at the pit's mouth. The royalty amounts to from 6d. to 8d. per ton. We have not had any disputes with the coal proprietors; they seem to have settled down to the present state of things as a sort of inevitable result. We have no coal in the district where these close stone quarries are; none within three or four miles. I think the coal mines are generally rated too high. I think, generally speaking, there is a disposition, particularly in agricultural districts, to rate manufacturing townships too high. I have taken into consideration the question that a rate is in mining cases upon part of the fee. I agree with that view to a certain extent, and I think some allowance ought to be made for it. That point appears very strongly in the case of open stone quarries, where the land is left afterwards useless for any purpose. I believe that in close quarries there is next to no waste of the soil. I think it is an anomaly that open workings should be rated and close workings not rated, and if one be rated both should be. As far as coal mines are concerned, the rate is rather too stringent. I think it unfair to other ratepayers that any property should be exempt.

In answer to Mr. PHILLIPS,—The distinction between a mine and a quarry is simply in the mode of working.

In answer to Mr. COLVILLE,—I do not think if mines are to be rated, that therefore all personal property should be rated.—What I ask you is this, if lead and iron mines are to be rated, where would you draw the line? Why not rate timber trees, and all other personal property?—I think there is no parity between the rateing of mines and timber trees.

In answer to Mr. RIDLEY,—Stock in trade should not be rated. I do not think that coals come under the denomination of stock in trade. I do not think that coal can be considered stock in trade until it is found on the coal merchant's wharfs, or in the retailer's shop. In rating coal mines in our county we do not take into account the destruction of the fee of the estate. I think we have been wrong in not making an allowance on that account. I do not think any calculation as to the *corpus* enters into the consideration of those who take the mines; if it does, it is very loosely calculated. I consider coal mines are worth from six to eight years' purchase, and I think that would be about the value of our freestone quarries. We are very short of railway accommodation in respect to them.

Mr. JAMES SAUNDERS RANDELL (of the firm of Randell and Saunders), Corsham Down Quarries, near Bath, stone merchant, examined by the CHAIRMAN,—We have about 150 men in our employ, and are the largest stone merchants in the neighbourhood. An open quarry destroys the surface, a close quarry does not; that is one reason why close working should not be rated; another is, that we are not rated by law. Does the open workings destroy such an amount of surface as to make it fair that they should be rated?—The destruction is about 10 feet below the surface. We pay about 560*l.* or 600*l.* a year royalty. We are not rated for our plant. We pay highway-rates, the payment of which we contested and failed in. I do not know how we are assessed to the highway-rate. I hear it said sometimes it is a shame that we do not pay rates, but I answer, we relieve the rates by absorbing the labour of the parish. We have, I think, raised the price of labour to the farmers, but I do not think they have fair cause of complaint, as the rates would be much heavier if the men were not so employed. I have heard from the farmers themselves that the poor-rate is not so high as it was. Would poor-rate affect your mine?—It would make no difference in our mode of working, for we are now 100 feet below the surface. As far as my experience goes, the working would be open or close as now, according to convenience. I think, if we are rated at all, the rate should be upon the profitable occupation, not on the amount paid for royalty. We have two rentals, one an occupation rental, and the other a royalty. I do not think all royalties are the same. We pay in Box parish 8s. a year superficial. The occupation rental is generally one tenth of the royalty—6d. per ton, and I would make the rate upon that. The royalty is what we can afford to give after deducting all expenses.

In answer to Mr. COLVILLE,—I really don't know upon what basis we are rated to the highway-rate, that is a matter which I believe the solicitors manage.

In answer to the CHAIRMAN,—It has been said that we should capitalise the mine according to the value, at so many years' purchase, and then take 3 or 4 per cent., according to circumstances, upon that, from which we should make a certain deduction, and so you would have your basis for the rate?—I think that would do in our case.

The CHAIRMAN, after consultation with the other members of the committee, intimated that no further evidence would be taken, and that the enquiry into this subject was closed. The committee will meet on Monday next, at three o'clock, to consider their report.

Copy of a letter from Mr. J. H. Cotterell, of Bath, to Mr. N. Kendall:

As to fixing the assessable sum or "rent," I take it for granted that the principle is admitted, that such assessable sum is a sum annually paid for occupation, and which in the cases of land and houses, &c., is known by the term "rent," such rent being, the sum which the occupier can afford to pay the owner of the property for its produce or crop, after deducting the expenses necessary (in the case of land) to obtain such produce. In the case of dwelling-houses, and other buildings, the principle does not apply; there "rent" is the sum paid for occupation, and that sum varies according to the law of supply and demand. How then does the principle of rent apply to mines of coal, copper, iron, &c., to clay works, and the freestone and limestone quarries? I should take first the market value of the surface of the material mined and quarried, and from that sum deduct, first, royalty due, or other payment made to the lord or owner; second, expenses of getting the material. This would be the general principle. But then some mines have better machinery, more convenient and costly shafts for pumping, and for landing the material, and are better situated than others as respects roads and markets. These are special circumstances, which I apprehend would have to be taken into consideration in assessing the annual value of each particular mine. I make no allowance for interest of capital, or expenses in carrying on the work; but there should be an allowance for profit to the tenant, as well as for the risk which the occupant of such undertakings always incurs: therefore I divide the sum left after making these deductions into two equal parts, one-half being tenant's profit, and the other the assessable sum or rent.

These principles could not, however, be applied indiscriminately without producing results which would occasionally bear hardly upon the owners and occupiers of mining property; but they might assist in carrying into effect the idea of a "scale," for which purpose I apprehend you would take the "royalty," or "due," or other payment made to the lord or owner, as a basis. I have very crudely (not having time properly to work out the matter) made a scale or proportion of such payment, which I take to represent rent:—

Copper mines, Tin mines, Coal mines, Iron mines (Welsh)	One-third of the due or royalty paid to the lord.
Freestone and limestone quarries	One-fourth of the due or royalty.

I also send the calculations by which these results are arrived at in the cases of copper and coal mines. But it is worthy of remark, that the coal owners of Somerset and Gloucestershire have, I apprehend, generally been satisfied to be rated nearly up to their royalty.

J. H. COTTERELL.

RATING OF MINES—COPPER MINES.

Value of the ore undressed at the surface ..... per ton	£4	0	0
Expenses of getting 75 per cent.	£3	0	0
Royalty, 1-10th	0	8	0= 3 8 0
Profit	£0	12	0

Half of the 12s. for tenant's profit gives 6s. per ton, and half of that again for risk, gives 3s. for rateable value, or about one-third of the royalty.

COAL MINES.

Value of the coal at pit's mouth ..... per ton	£0	13	4
Less cost of getting	£0	10	6
Royalty	0	1	3= 0 11 9
Profit	£0	1	7

Half of this for tenant's profit 8½d., and half of that sum again for risk, leaving 4¼d., or nearly one-third of the royalty, as rent or assessable value.

MEMS. OF MINES AND MINERS.—No. XII.

The late Right Hon. Lord DE DUNSTANVILLE (Tehidy Park, Cornwall).—It is refreshing to the mind to contemplate a character like the person's whose brief memoir we proceed to chronicle. Fame has long since rendered the name a household word in the regions of science. Eulogy itself has been exhausted in its praise. Last, not least, the silent though significant obelisk on the summit of his favourite Carn Brea Hill attests the gratitude of those sons of toil who reaped the benefits of his practical philanthropy during his lifetime. Lord De Dunstanville was the man to set the example (so worthy of consideration and imitation) of relinquishing dues when mines could not maintain their expenses, or be wrought at a profit. Since his decease his successors, as well as a few others, have followed his example. This wise, generous, though, in proof, truly politic step, has led to the vigorous working of mines on the estates that were previously in dubious circumstances, and on the eve of being discontinued; it has been the cause of thousands on thousands of pounds being added to the family coffers. Two splendid candelabra, each weighing 3000 ozs., made from silver produced at one of his lordship's mines, attest the feelings of the adventurers on his splendid liberality, whilst the monument before alluded to plainly indicates what the sentiments of the working population were. It does equal honour to them and to his lordship's memory. He was not only a liberal landed proprietor, but a generous contributor to every institution tending to promote the interest, comfort, education, and well-being of the miner. Whether in the Senate or in retirement, his lordship always had sympathy for the working man, and that sympathy he expressed more by deeds than words; hence the reason we use the term, practical philanthropy. By practises such as these he won and kept, as he deserved, the affections, love, and respect of the whole population. Miners, in particular, owed him a debt of gratitude for his exertions, which they repaid as nobly as laid in their power. The name of Dunstanville, though the title be extinct, will never be forgotten by the descendants of those his munificence benefited, as long as there is a mine in Cornwall, or a miner to work it. The motto attached to the family arms is "Pro rege, lege, grege," which motto, by his loyalty, from the exercise of which he received his baron's patent, being previously Sir Francis Basset, his love of order and good fellowship, and his munificent charities, he seems fully to have deserved and fulfilled. We conclude with the words on his hatchment, "Requiescat in pace."

Capt. GRENFELL (St. Just, Penwith), was chief captain of the celebrated Botallack Mine for many years; during his management the mine was in great repute, and was the principal mine in the western district, until eclipsed by the discoveries at that time made in Boscaswell Downs and Levant. The Botallack Mine has been worked for generations for tin ores; the Bunny, or part of the mine in which tin floors close to the surface existed, are certainly of great antiquity, but long before the time of Captain Grenfell they were exhausted. During his career, the Wheal Hazard, Codna, Reeth, and Crowns lodes were productive. The mine about the years 1831 to 1833 became very poor, and Capt. Grenfell relinquished his post. The result of the management of the latter working, under Capt. James, is too well known to need remark, a proof in point of the *nil desperandum* character of a lode that has once been proved to be a good one; the adjoining mine, Wheal Cock, is also another satisfactory instance; this having been abandoned as being worked out, but is now added to Botallack sett, and is said to be the most valuable part of it. Captain Grenfell enjoyed the reputation of being a good practical miner: he undoubtedly was an able captain, and worked his mine on the most economical scale, but he was one of the old-fashioned school, and did not display that readiness in adopting improved methods now so much practised by modern Cornish agents; nevertheless, the captain enjoyed a large patronage, and was himself a heavy adventurer in mines, as well as his son, Captain Nicholas Grenfell, who was as smart a captain as St. Just ever produced, until the terrible malady (worse than death) deprived his county of his services; an early death cut off this promising man from a large circle of sorrowing friends. His father, the subject of our memoir, survived him many years: he retired on an ample competency in his native village. Previous to his decease he was for a long time afflicted with blindness, probably the effect of old age and great exertion in early youth, as it came on gradually with declining years. It was the old gentleman's delight to be visited by those who knew him in his days of strength and activity, to talk over old scenes and stories of events long since passed. He was the companion and friend of Captain Chennals, the patron of Jemmy Wall, and the employer of the two Warrens, all whose characters have been previously portrayed. The captain has been dead a few years only, and left a name such as his descendants may well be proud of.

Capt. WM. HEATH (Lydford, Devon).—This person was verily and indeed a miner, a real Blackwater miner, who knew both tin and copper, who had worked in every sphere of the profession, and by his own industry and ability earned his way into places of considerable consequence and trust. He was one of the captains selected to go out to Brazil for the purpose of working the gold mines, which situation he accepted, and for some years succeeded in making the mines pay. He there gained considerable knowledge and experience in gold-washing and jacotinga working. Not liking the country, or the management probably, as soon as his term of engagement was up he returned to this country, where he readily found employment as a captain. He was extremely unfortunate in the

companies by whom he was employed latterly, as not one of them were solvent sufficiently long to give him or the mines a fair trial; two or three years on the average being the term of wretched management, quarrelling committees, unpaid men and merchants, by which means they, as a matter of course, fell into difficulty, disgrace, and ruin, not by the fault of the captain, but through the gross carelessness and culpable actions of the directories. Capt. Heath, though quite uneducated, by self-culture and observation had qualified himself to mix in any society; his conversation and experience in mining affairs afforded considerable interest and instruction, his unassuming, unsophisticated manner rendered access or acquaintance easy; his openness and desire to give information was only exceeded by the plain, practical manner in which he conveyed it. He died at Tavistock about three years since, at a middle age. From a letter received by the author, which was written a few days before his death, it appears a journey to Spain to inspect some lead mines considerably impaired his health, previously shattered by residing abroad, and grief for the untimely death of two sons a short time previously. Mr. Heath was a frequent contributor to the pages of the *Mining Journal* on subjects of practical mining, many of them bearing evidences of considerable ability and tact as a writer, as well as of thoroughly practical and useful suggestions and remarks. At the time of Berdan's gold experiments he, at the outset, condemned the mode of operating, and cautioned the public to beware: it would have been well had his warnings been taken.

TO INTENDING TOURISTS THROUGH CORNWALL.—No. IV.

There is little more of consequence in the line of coast to the river Hel, across the ferry of which our travellers had better make the best of their way. Even there little is to be seen, this belt of killas being unproductive of mineral—that is to say, no mines have been worked or discovered. Hitherto it appears to be a monotonous mass of clay-slate, traversed occasionally by small veins of quartz: it is only worth visiting for two or three raised beaches, of which we have already offered numerous instances.

At Maenporth, we encounter the first of the elvan dykes—a certain sign we are about to enter the metalliferous series of rocks; for where elvans do not exist in Cornwall ores in any quantity, or of much value, are seldom found. Hence one of the first enquiries of the miner is, where is your nearest granite? where are your elvans? This elvan dyke runs nearly north-east and south-west, and is distant about two miles from the great granitic mass extending from Carn Brea on the north to Constantine on the south. On its northern, eastern, and western boundaries this granite abounds with tin and copper deposits, and some of the largest mines are on its edges. Few explorations have, however, taken place on the south part. At Pennance a second elvan occurs; this is in a soft decomposed state. About 30 years ago it was worked by the late Mr. Bone, the proprietor of the estate, in conjunction with the father of the author, for some time as china-clay and stone. The supply of really good clay was so limited, and the immense quantities procurable at St. Austell at a much cheaper rate, rendered this unprofitable, though at one time it promised to be of great consequence; however, the works entailed no loss on the proprietary. On this estate is a large lead lode, which at one time held out good prospects. Had it been worked near the intersection with the elvan, great results would have attended the speculation, but it was never properly prosecuted. A company was lately formed to work this sett: the old works were partially cleared up; lead ore and splendid lead gossans were found almost at the surface. The undertaking, *per se*, was deemed legitimate, and capital subscribed; several meetings were held, but the management (?) quarrelled over the purchase-money and allotment of shares, and the matter dropped; and, to the disgust of many who were induced to join the speculation (this is the history of many other concerns that have been called mining) no further trial was made, though they discovered everything they expected or desired as far as they went.

The next sett constitutes the Swanpool Mine, which has now been worked for some years on a lode that runs parallel to the Pennance great lead lode. Considerable parcels of good lead ore have been raised and sold from this mine, and very large quantities of inferior, the lead in which is too much distributed to be cleaned by the present mode of dressing: had they one of Vian's lead and jack dressing-machines, all could be returned at a good profit. Until within the last ten years this district had been quite in abeyance, and it is only by the great promise held out by the Swanpool Mine that the interest now manifested has been revived. The old burrows close by the Swanpool Lake indicate the lodes alluded to.

We now cross the Gernravase Sands. At an elevation the raised beach may be again observed distinctly for a long distance towards Pendennis Castle. Keeping along shore at low water, near the narrow neck of land forming the isthmus, joining the peninsula of Pendennis to the main land, a vast number of strings of quartz may be detected traversing the killas in all directions, which is here highly mineralised, and congenial for metallic produce. A small trial pit was sunk a few fathoms from low-water mark to test a lode, and lead ore, with a small quantity of copper, were found. The Admiralty interfered, and prevented its being wrought. The pit may easily be found, and the lode seen and traced. Coasting round under the castle hill little is to be seen; we must, therefore, pass over and through Falmouth, near Selly's Hotel, Green Bank (by the way, one of the best and most picturesquely situated houses in England). In the cliff towards Penryn the back of a lode, running through the Penwerris estate, may be seen, but is not of much value. Keeping along the shore of the Penryn Creek, we arrive at Poundgharden. To the west of the high road is a lead lode; an adit was driven some years since into the Barn estate to cut it, but nothing further was done. Several lodes are known to exist in this locality, particularly at College Wood; here the granite again occurs. At Kergilliack is a fine decomposed granite and elvan, from which excellent fire-brick was made; and at Bicklinwater, at the junction of the granite with the killas, was a fire-clay of very superior quality, once much in demand at Swansea for coating ladles used in casting copper into ingots.

At Tremough, near Penryn, the granite again occurs. Near the junction are several important lodes, wholly neglected. This is the mass of mountain granite called the Mabe and Stythians granite, from which the greater part of the London and Waterloo Bridges were built. On the opposite side of the road, leading to Redruth, at Treluswell, is a vein of magnetic iron ore of extraordinary power, but in too limited quantity to be of any commercial value. Returning by the east side of the Penryn Creek, we pass by an old adit, driven several fathoms to cut a lode running from the Sailors' Creek through the glebe lands at Gluvius, but whether this was accomplished or not I believe nobody knows.

The whole coast presents nothing more of interest to the geologist, except the beautiful scenery of Falmouth Harbour, until we pass the village of Flushing, close to which is Wheal Clifton Lead Mine. A capital engine has lately been erected on the low cliff, close to the sea. This appears to be a promising concern. The lode, by the stuff, seems to be a good natured one, and is embedded in kindly strata. The situation will afford capital opportunities; the facilities for obtaining coals, timber, and other mine materials, shipping the produce, and the ease with which the rubbish may be disposed of, are unusual. At Kiln Quay, a little further east, is another fine lode, running parallel to the Clinton, well deserving a trial, as is also one near Mylor Quay. At Great Wood, still east, a huge cross-course comes in, and continues to Mylor Downs, where its effects are extraordinary. After passing Great Wood, we arrive at Restronguet Passage, the gorge of the far famed Carnon stream, a place celebrated for ages on account of its immense deposit of stream tin, probably the earliest and richest ever worked; this stream extends inland for many miles, and has been worked under the tidal river between the silt and the rock, at a vast expense, to within half a mile of this spot (Restronguet). It has been projected to work it at this place; indeed, within the last three months the author has been consulted as to its practicability. Having given this subject much attention, he verily believes that at this piece of the stream, and to a quarter of a mile south of the narrow passage at Restronguet, the richest part of the whole series will eventually be found. It is supposed that this stream was one of the earliest places in which tin was discovered in Great Britain. During its last working it was considered the most extraordinary and interesting mine ever wrought, the method adopted being novel and peculiar. (For particulars of the curious workings and general history of the Carnon stream, see *Henwood's Lectures on Mining and Geology*, price 2s. 6d.)

Continuing on the beach of the Restronguet Creek, we pass Halwyn, where the backs of two or three small lodes may be seen in the low cliff. The banks of the river now become so level that no geological observations can be made on them. It is said a fine tin lode exists under the mansion at Carclew, which we very much doubt. Certain it is that on Mylor Down, just on the boundary of the Carclew estate, is a fine old mine, formerly called Wheal Lemon, but abandoned 40 years since; here are five known lodes, and an enormous sparry cross-course. This is a fine speculation, if the sett could be procured. The old men put up here one of the first "fire engines" ever erected in England. But to return to our subject. Keeping along the west side of the creek, we come to the great mine foundry of Fox and sons, at Perran Arworthal, near which is a mine on the hill, called Perran Wheal Jane, now abandoned. Just west of this is the old Wheal Maudlin Mine, celebrated for a peculiarly fine crystal of iron found there; this mine has also been neglected many years. We must now cross the Carnon stream by the turnpike-road, up the valley of which lie Nangiles, Wheal Baddern, Bal Du, and the Chacewater Mines; east of these are the Great Wheal Jane and East Falmouth. Again, continuing our coasting, we come to Devoran, the great *entrepôt* for shipping ore from the Consolidated, United, St. Day, Gwennap, and Kenwyn Mines. A railway worked by horse-power has been constructed to these mines, as far back as the year 1825. This railway must now be followed to a village called Point, where there is a rather extensive lead works, founded by the late Mr. Swann, where he returned large quantities of silver from the gossans of the old Wheal Falmouth, Herland, Dolcoath, and other mines; this was done by the old blowing apparatus, before Patterson's desilvering process was discovered. The smelting works are now successfully carried on by Mr. Mitchell. The road, or foot-way through the croft, by the river side, must be followed to Restronguet Passage again, where, just above the point at which the ferry plies, an extraordinary echo, repeating several times, may be heard. Opposite this, on the west side of the river, in the cliff between the Ship public-house and a cottage *ornée* on the height, a vein of fine-grained clay-slate may be found, admirably adapted for razor hones, for which purpose, several years ago, many tons were raised and carried away, without leave or knowledge of the landlord, who immediately put a stop to it. The late Sir William Lemon was the proprietor, and as it would endanger the safety of the path-way he put a decided veto against any more being removed.

We are now in the parish of Feock, on the shore of the Falmouth Harbour, for such it still is. In the rocks, at low water, many small strings of quartz may be seen, but no decided lodes; indeed, we may say this is now almost out of the mineral district, which seems to be cut off at the deep valley, below Point, which runs east towards Killaganoon.

At Trelissick Point, a small lode exists, as also does one a mile above King Harry Passage, some distance up the Truro River; the latter is difficult to find. This and all the cliffs above are so luxuriantly clothed with vegetation as to defy the geologist's scrutiny. Near Newham, about a mile and a half below Truro, there is said to be a very promising lead lode discovered lately. This is a very likely spot for such a deposit, as a kind of sandstone, or soft elvan species, is found close by.

This terminates our journey eastward, and we will, therefore, to the house of the old worthy adventurer, John Lenderyou, Red Lion, Truro, to chat over mining news, of which he is a walking chronicle; and, by a good night's rest, prepare for a jolting ride, by the worst of all railways, to Penzance, *en route* to the Land's End, again to commence our tour round the north-eastern coast of the county.

STATISTICS OF THE IRON MANUFACTURE OF GREAT BRITAIN.

The following RESULTS have been collected from various authorities, including Marshall's *Statistics*, Porter's *Progress of the Nation*, Returns from the Iron Districts and from the Custom-house to Parliament, showing at different periods, from 1788 to 1857, the prodigious wealth created for the British empire, out of materials abundant, and otherwise useless, by the inventions of Henry Cort.

IRON MANUFACTURE.

1.—The total make of pig-iron annually with pit coal, from 1788 to 1856, is more than 60,000,000 tons.

2.—The total make of rolled and other forms of wrought-iron, allowing for waste, is 30,000,000 tons, and the saving to the country, at 30*l.* per ton, the average price previously paid for foreign iron is 900,000,000*l.*

3.—The total saving by railway conveyance is estimated by Mr. Robert Stephenson to be now progressing at the rate of 40,000,000*l.* annually, and the aggregate saving for the last twenty-seven years may be estimated at 300,000,000*l.*, being more than the whole cost of the railways referred to by Mr. Stephenson.

4.—The total quantity and value of British iron of all sorts, and steel exported, from 1792 to May 31, 1857, is not less than 16,987,167 tons, and the value received from foreign countries 179,975,345*l.* sterling.

5.—The total value of hardware and cutlery exported, from 1805 to 1857, at different periods, is 85,394,864*l.* sterling.

6.—The total value of machinery, steam-engines, &c., exported, from 1822 to 1857, is 25,192,555*l.* sterling.

7.—The total general amount saved by increased export, received from foreign countries, is 290,562,764*l.* sterling.

8.—The total amount saved by decreased import, from 1792 to 1857, being so much less paid to foreign countries for bar-iron, is 33,778,540*l.*

GENERAL SUMMARY.

Total amount saved by 30,000,000 tons of bar and other forms of wrought-iron, made out of materials abundant, and otherwise useless, and by the employment of 600,000 of the working classes for three or four generations	£900,000,000
Total amount saved by railway conveyance	300,000,000
Total	£1,200,000,000

The total saving now adding to the wealth of the nation is not less than 100,000,000*l.* annually.

DIFFERENCE OF EXPORT AND IMPORT.

Total amount saved by increased export	290,562,764
Total amount saved by decreased import	33,778,540

The total number of puddling, balling, and heating furnaces patented by Henry Cort, and now in use in Great Britain, is estimated by Mr. Truran, late engineer at the Cyfartha and Dowlais Ironworks, to be 8200, while the grooved rollers, also patented by Henry Cort in 1783, are now used by this and all other nations for making bar and other forms of wrought-iron, at the rate of 20 tons for 1, in the same time, and with the same number of hands, as compared with the forge hammer. The total number of furnaces patented by Henry Cort in 1783 and 1784, and now used for making iron in this and all other countries, is not less than 16,000.

These services have rendered the British nation independent of foreign powers for that most indispensable article—bar-iron—not only for the last 70 years, but for ever. They have secured the safety of our fleets, the lives of our seamen, and the defence of our forces, by sea and land, not only for 70 years, but for ever. They have provided the British nation with more than sufficient wealth to pay all the expenses of the three last wars, and have principally aided in bringing these contests to an honourable and triumphant conclusion.

For these services the Cort family have received *no remuneration*, Henry Cort having sacrificed the whole of his private fortune, 20,000*l.*, in bringing his invention to perfection, being 15,000*l. more* than all the pensions received for the last 64 years!

The *Times*, with more than 50 other influential journals in this country, as well as the *Scientific American*, published at New York, in December last, have each and all denounced, in powerful leaders, the *ingratitude* of the British nation to Henry Cort. See also *Times* and *Examiner* last week.

Henry Cort was ruined by the defalcations of a servant of the Crown, of which he was neither directly nor indirectly conscious or blameable. The son of the latter being the partner of Henry Cort, was placed in possession of all the trade and works, and held possession of the whole exclusively for his own benefit for 30 years, that he might not impeach the misapplication of the nation's trust in others to a prodigious amount. Henry Cort was robbed of all his patent rights and property, worth when they expired in 1798 at least 250,000*l.*, by virtue of an *extent* obtained by one of the defaulters swearing that he had paid money to Henry Cort, which he himself had never paid; while the greatest defaulter ever known to the State afterwards obtained from the Lords of the Treasury nearly 25,000*l.*, by a statement *equally false*, only four days after the decease of Henry Cort, when he was no longer living to expose the imposition. This act was denounced in the House of Commons, in 1805, as money obtained from the Crown under false pretences.

"Let any one think," says the *Times* of July 27 last, "of our iron fleet, iron gun-boats, iron mercantile marine, iron railways, iron engines, iron cotton mills, iron suspension and tubular bridges, iron batteries, iron palaces, &c., and then ask himself what should be the measure of public gratitude to the descendants of a man who endowed his country with such an amount of wealth and power?"

Lord Palmerston is the only Prime Minister, during the last 30 years, who has given attention to the claims of the Cort family, by instituting enquiry into the merits, and giving some proof of a generous desire to save from destitution and want the only living son of the late Henry Cort, now more than 73 years of age. The pension of 50*l.* per annum, recently granted, has been almost wholly swallowed up for years by encumbrances from previous destitution. Under the auspices of Lord Stanley, who has presented a memorial to his lordship, praying for further enquiry, backed by the highest scientific engineers and practical authorities, and supported by more than 50 Members of Parliament, the descendants of Henry Cort—one son and three daughters—may yet hope for some more adequate compensation from the British nation than hitherto received.

ROCKS AND MINERAL DEPOSITS OF NAMAQUALAND.—No. X.

The deposits of copper ore are the most important of the metallic deposits of Namaqualand, and the largest of those deposits—that is, of the known deposits—I mentioned in the beginning of these papers. There does not occur, to my knowledge, a regular lode of copper ore in that country. The deposit of the Hester Maria Mine, at Concordia, might indeed be termed a lode, if the circumstance of the deposit being enclosed for a few scores of yards in length would sufficiently charaterise the same as such; but I should rather feel inclined to term this deposit an oblong, or lode-like bunch, and thus classify it under the same head with all the other deposits of the country. This deposit (Hester Maria) is situated near to the southern extremity of a gneissoze ridge, or "tongue," that is stretching in a southerly direction, and the continuation of which is traceable all along the bottom of the valley, or rather plateau, for a considerable distance to the south. Close to the deposit there occurs a band of pyritous greenstone, which becomes exceedingly rich in pyrites (iron and copper) when approaching, and coming within the radius of, the deposit. The greatest length of that deposit stretches from east to west, veins and strings of quartz and iron constituting the continuation of the deposit on either end; it is a question whether those veins indicate only a squeezing up of the deposit, in which case copper ore might again be met with in depth, or whether they indicate a total discontinuation of the copper ore—the latter appears to be more probable. The principal produce of that mine is yellow ore, mixed occasionally with grey; crystals of native copper have been met with; the occurrence of molybdenum in nests within the copper ore is worth noticing. The deposit is being cut out by a large open cutting made into it from the top, and by levels driven into it from the east side of the hill. Further to the east from this, on the bottom of the plateau, there occurs another, but apparently smaller and shallower deposit (now abandoned), which I shall designate by the letter A. This deposit bears with its greatest length in the same direction as the deposit of Hester Maria, and the quartz, &c., veins and strings above alluded to might be considered as the cables which connect the two bunches. To the north-east from there occurs a small hill, a "koppy" (B), consisting of partly decomposed, partly hard, and highly silicious rock, composed of hornblende, iron, quartz, mica, and traces of felspar; the whole, and more especially the cleavage planes, of which are highly impregnated with copper green, but no distinct deposit of copper ore, not even the smallest, being traceable. An open cutting was made into this hill by the Dutch in olden times. Farther north-west from these is found a stripe of cupreous rock (C), running east and west—no trace of a distinct deposit; but grey ore (and greens) is scattered throughout the whole strip of that rock in small minute particles, forming, in fact, a component of the rock. To the westward from the ridge in which Hester Maria Mine is situated, occurs another hill (D), (known under the name of "Twee Fontaine"), which, in addition to a strong development of copper greens, contains also distinct, though small, masses of ore. To the southward from the same is Wheal Julia,* which in many of its features bears resemblance to the deposits mentioned under A, with the exception that Wheal Julia is situated on a higher level than A. Numerous other spots are noticed in this neighbourhood to the north, south-east, and west from the spots mentioned above, but they are too insignificant to particularise in this paper, though highly deserving of great attention: the largest of which (for example, lease No. 6) have, however, produced a few tons of ore.

Springbok Mine is situated on a lower level than the Concordia Mines, and in a southerly direction from there. It occupies the east side of a gneiss mountain, which is traversed by channels of reddish quartzose rock, in which the whole radius of the deposit appears to be, as it were, encased; these quartz channels run east and west. The deposit itself consists of a group of veins, strings, occasionally small floors, knots, and bunches, of several varieties of copper ore, of which purple ore, earthy red oxide, and grey ore, appear to be the most conspicuous. The ore is imbedded in rock of a mostly disintegrated, and partly or wholly decomposed nature, which is occasionally traversed by masses of a harder and more silicious rock. This mine is the richest of all, and will, in all probability, continue to be so for a considerable time. The ore at present is mostly cut out by a series of surface stopes; but, owing to the very great irregularity of the deposits, the planning of the respective operations will, indeed, require even a far greater precaution and sound judgment, and the carrying on of the same a far closer superintendence than would be required for the underground operations in a regular lode.

Naparbeep, which is situated in the vicinity of, and nearly on the same level with Springbok, bears a very strong resemblance to the hill near Concordia, which I mentioned above, under B; but Naparbeep is much larger, and far more developed, and contains hence numerous veins and strings of rich ore. There is another place, Uchup, which has not been opened yet (1856), and which also contains a good quantity of ore. Further south-west, on a lower level, within the proto-gneiss group, at the junction of the Schaap and Buffalo Rivers, there is situated Wheal Maria Mine, on the southern, or rather more properly south-south-eastern slope of a proto-gneiss mountain range. A band of greenstone (alluded to above) occurs to the north of it; a ridge, or tongue, of highly silicious granitic gneiss stretches in a southernly direction across the valley on the west of the deposit. Similar rock occurs on its east side, where a few quartz strings appear to form a continuation of the upper northern part of the deposits; where, however, if there should be at all a continuation of the principal deposit, I have strong reason to believe the same is situated more underneath the soil of the valley, rather than in the mountain on the north side. Hard and silicious bands occur also within the deposit itself, alternating with more decomposed portions. The greatest quantity of the ore which is found here is purple and grey ore, with occasionally earthy red oxide—a transition into yellow sulphuret and peacock ore has been found on the east side of the deposit; and here, as well as in all the other deposits, more sulphurous ores will be met with in depth. The deposition of the respective strings, veins, bunches, &c., of ore is similar to that in the Springbok deposit. The fact of a fossil—a cuprefied toad—having been found in the deposit of Wheal Maria is deserving of notice.

To the east from Wheal Maria, and separated from it by a mountain ridge, which stretches forth in a southerly direction from the more bulkier mountains of the north into the valley, is Schaap River Mine (now abandoned), which might be said to represent similar features to Wheal Maria Mine, only being to all appearance much more imperfectly developed, and containing hence much less and much smaller distinct deposits of ore. Between the Schaap River deposit (and to the east of it) and Wheal Maria Mine, as well as to the westward from Wheal Maria Mine, there occur on several spots traces of copper—cupreous clouds, if that expression could be used—here and there in the rock; and when I was not yet sufficiently acquainted with the peculiar characteristic features of that country, I was under the impression that such spots were the occasional outcrops and heave indications of one run or lode of copper ore, certain parts of which were squeezed up, and covered over ("capped") by surrounding rocks. Numerous small and insignificant deposits are scattered all over the country, to which I shall make allusion below.

The principal deposit in Northern Namaqualand is Kodas Mine (now abandoned); here the principal matrix of the ore is a highly decomposed talcose rock, running north and south, and encased on either side by hard silicious rock. The ore—principally yellow, blue (indigo), peacock, and black ore—existed in that decomposed rock in the shape of irregular strings and bunches, for which, as they were imperceptibly tapering and fading away on either end, the term "clouds" of ore might be very expressive: the deposit appears to dwindle into mere quartz stringa towards the north, numerous larger and smaller meridional bands of milky quartz occurring along side and parallel with, and to the south as well as north of it. The deposits at N'Omies, a tributary valley to the Kodas basin,

* The only spot where I found compact masses of black oxide.

about six miles to the south of Kodar, occur in several parallel runs, each of which is formed by a number of quartz veins being wedged into the foliation planes of the schistose rocks, and containing principally grey ore, in small nests, strings, and veinlets. The easternmost run, in a greyish-blue talcose schist (above alluded to, with its bend of the foliation planes), and situated close underneath the sudden and steep rise which marks out the edge of the higher level to the east, contained a vein 1 foot in breadth, which was purple ore close to the surface,* changing into a mixed dark grey ore at some depth. That vein, in its structure, was exactly like the surrounding rock, the ore breaking out in similar slabs as the rock; and the cross fracture of such a slab of ore presented various stripes, either reddish-brown or dark brown and green, purple ore, or a pitchy-looking variety of ore (manganese copper), or the dark grey variety changing alternately with green (carbonate or silicate) stripes. This vein changed too into quartz strings in depth. This deposit is the only one (excepting Hester Maria, in Southern Namaqualand) where molybdenum has been found, of which I dug out a few small pieces from the westernmost string, in a shallow shaft on the south side of the valley. Tracing the continuation of this deposit farther northward, I found it to undergo a change of contents—iron, and occasionally manganese (the former in the shape of brownish powdery oxide and lighter hydrated oxide, which, owing to having found the same enclosed in cavities of a perfectly crystalline cubical shape, I am inclined to consider as the results of a decomposition of iron pyrites, which fact, with those of the occurrence of carbonate of lime in the rocks, sulphate of lime in the deposits of copper and in the water, and of carbonate of copper, &c., gives rise to some very interesting meditations on the chemistry of Nature). Further to the north, in a kloof, there occurs fine-grained galena; still further north (beyond an east and west mountain branch) specular iron; and within the same run, which is distinctly traceable all along, copper again, some miles further north. Almost all the deposits in this part of the country undergo a change of contents in their run.

Numerous other deposits occur in this vicinity (I met in the radius of the Kodas basin alone with more than thirty distinct deposits, many of which were, however, very small), and all, without exception, running parallel with the surrounding rocks—in a meridional direction. The dip of the respective deposits correspond with that of the rock in which they occur; being in some very slightly west, in others very slightly east, and vertical in the middle of each band of rock. * * *

A few days ago I saw a paper by Mr. Evan Hopkins, "On the Vertical Structure of Primary Rocks;" and an east and west section across the primary schists of South Africa, would exactly resemble, in its general features, the section exhibited by Mr. Hopkins. Taking a section just of a portion of the Kodar basin, and of its eastern edge, commencing, say, on the lower level, to the west from "Katjes Bank," and going eastward, we find light porphyritic granite (being the base of the valley), changing towards the east into a highly silicious granite; schistose quartz rock, dipping slightly west, and containing alternating bands of milky quartz and talcose schist (some of the latter very thin, from 4 to 8 feet only in thickness); gneissoze schist, the western edge of which dipping east, the eastern edge west; quartz rock; then a rock which is something between chloritic and talcose schist, with quartz bands, containing specular iron, and occasionally green chlorite; quartz rock; silicious and pyritous granite (vein of iron—N.B., now we are on the higher level); talcose schist; quartz rock; silicious granite with green veins (of epidote), and patches of hornblende; syenite; hornblendic schist, &c. The broader schistose bands dip with their foliation planes in various ways, being invariably vertical in the middle, the foliation planes on either side dipping towards each other, so that, if we were to take the middle of all the various degrees of dip in the same band of rock, we shall find it to be =0.

Finding now numerous bands of such schistose rocks alternating with granite, the latter being noticed on the western lower level, as well as on the eastern higher level; without that any portion of the surface of those rocks is covered over by sedimentary rocks, that might afford a hiding-place for theoretical speculations, there are only two explanations possible,—either that there is truth in Mr. Hopkins's theory, or that if those schistose rocks be the uplifted edges of horizontal layers of sedimentary rocks, then the granite which is found alternating with them, must be a sedimentary rock too.

It is a matter of course that any new theory should be subjected to the most minute and careful scrutiny before it is accepted; yet it could not be said that the theory which takes those rocks which differ from granitic rocks only in the arrangement and distribution, but not in the nature of components, to be ancient sedimentary rocks, had been sufficiently subjected to such scrutiny; and the arguments which have been advanced against Mr. Hopkins's theory, are, it strikes me, a *testimonium paupertatis* to the clearness and solidity of the "established" theory; and as a majority of voices, be they even the voices of the whole professional "hierarchy" of science, is of not the least avail against a majority of sound arguments and facts, the issue is rather in favour of Mr. Hopkins.

Science is, or at least ought to be, the common centre towards which all knowledge and experience gained in all the various branches of men's labours and industry should flow, in order to be freed there from all impurities, so as to be perfectly pure and clear, when it exradiates again from that centre for the purpose of guiding and invigorating the complicated machinery of social life; hence scientific men, and scientific institutions, should never be possessed by that mean spirit which sometimes is exhibited by tradesmen and joint stock companies, who are desirous of crushing a rival.

There are, indeed, amongst the opponents of Mr. Hopkins men whose really useful labours entitle them to a good position in the Temple of Fame; but for that very reason they ought to be the more careful, least by too hotly, and hence blindly, opposing themselves against what, merely by the irresistible force of facts, might, perhaps, establish itself as truth, they might throw a veil over their reputation, which would prevent future generations from seeing distinctly and appreciating fully their merits. JULIUS.

* The ground where this deposit occurs was covered with bushes, the deposit itself with vegetable soil; but I discovered the deposit owing to a few ferruginous shode-stones inducing me to examine the ground more closely.

INVESTMENTS IN BRITISH MINES.

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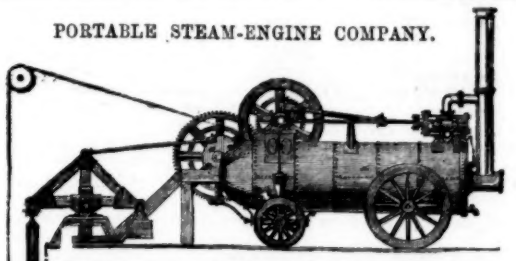

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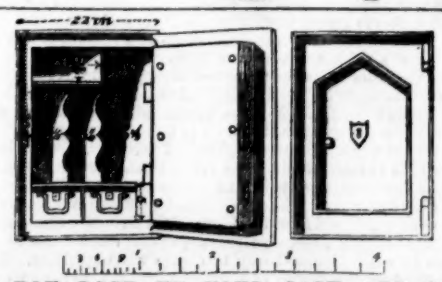

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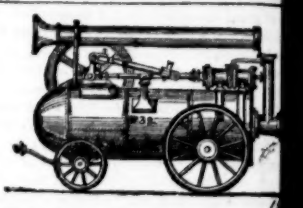

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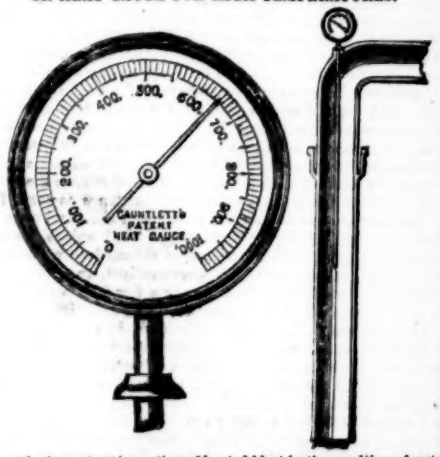

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